A New Species of *Gyrostipula* (Rubiaceae, Naucleeae) from Madagascar

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ABSTRACT. *Gyrostipula obtusa* Emanuelsson & Razafimandimbison, a new species of Rubiaceae (Naucleeae) from Madagascar, is described and illustrated. The new species differs from its congeners, *G. comorensis* J.-F. Leroy and *G. foveolata* (Capuron) J.-F. Leroy, by its obtuse leaves with more densely spaced lateral (secondary) veins and shorter petioles.

Key words: Cinchonoideae, *Gyrostipula*, IUCN Red List, Madagascar, Naucleeae, Rubiaceae.

The genus *Gyrostipula* J.-F. Leroy (Leroy, 1975) belongs to the subtribe Breoniinae Razafimandimbison & B. Bremer s.l. (Rubiaceae, Cinchonoideae, Naucleeae) (Razafimandimbison & Bremer, 2002). In his *Generic Tree Flora of Madagascar*, Schatz (2001) included *Gyrostipula* in a broad circumscription of the genus *Breonia* A. Richard ex DC. However, *Gyrostipula* has been shown to be a well-defined monophyletic genus, which can easily be distinguished from the other Malagasy Naucleeae by its long, convolute, red, filiform terminal vegetative buds and red placentae that are persistently attached to the septa even after the fruits dehisce and release the mature seeds (Razafimandimbison & Bremer, 2002). The genus has also been demonstrated by Razafimandimbison and Bremer (2002) to be sister to the monospecific Malagasy genus *Janotia* J.-F. Leroy (Leroy, 1975). These sister genera are both diagnosed by their ovules, which are attached side by side to the base of the placentae. Presently, *Gyrostipula* (Leroy, 1975) contains two species, *G. foveolata* (Capuron) J.-F. Leroy, which is confined to but commonly found in the midelevation and humid forests of Madagascar (Capuron, 1972), and *G. comorensis* J.-F. Leroy, which is restricted to the Comoro Islands.

During the taxonomic revision of the Malagasy genus *Breonia* (Razafimandimbison, 2002), the second author discovered at the TEF herbarium in Madagascar a single collection of Naucleeae (*Service Forestier 27633*), which Capuron had initially identified as *Breonia*. However, subsequent morphological investigation conducted by the second author revealed that the collection represents an undescribed species of *Gyrostipula*, which we describe and illustrate herein.

Gyrostipula obtusa Emanuelsson & Razafimandimbison, sp. nov. TYPE: Madagascar. [Est (Nord)], "Environs Nord de Seranampotaka entre Nosiarina et Antsirabe-Nord (route Sambava-Vohémar)," 30 Mar. 1967 (fl), *Service Forestier 27633* (holotype, TEF; isotypes, BR, P). Figure 1.

Haec species a *Gyrostipula foveolata* (Capuron) J.-F. Leroy foliis obtusis, venis lateralibus densioribus et petiolis brevioribus differt.

Tree, 20 m tall, stem 0.60 m thick, young twigs of leafy stems angular, becoming terete with age, glabrous. Stipules of terminal vegetative buds 4–7 mm, red, filiform and convolute, ± twisted when dry, deciduous; petioles 4–8 mm, glabrous; leaf blades 2–5 × 0.8–1.8(2.2) cm, obovate to elliptic, glabrous, apex obtuse, base acute, margin glabrous, entire, lateral (secondary) veins ca. 9 to 12 on each side, spaced 2–4(5) mm apart, attached to primary veins at angles mostly > 60°, tuft-domatia mostly at bases of secondary veins. Inflorescences lateral, solitary, heads 1.2–1.7 cm diam. (including styles); inflorescence axes 9–13 mm, flattened, less thick than the adjacent petioles, glabrous; peduncles visible in part (above the calyx lobes), 0.5 mm; bracts enclosing the young inflorescence calyptra-like, deciduous. Flowers 4-merous; calyx tubes to 1.8 mm, inside and outside pubescent, calyx lobes to 0.2 mm, broadly triangular to truncate, outside often glabrescent in the middle; corolla tubes 3.5–4 × 0.3–0.4 mm, outside glabrous, inside pubescent, corolla lobes ca. 1–1.5 mm, oblong, with a small dorsal subapical swelling, outside pubescent toward apex, inside variously pubescent, often glabrescent with a longitudinal line of hairs in the middle; anthers 0.7 mm, filaments 0.2 mm, flattened; styles 6–7.5 mm, glabrous; stigmas clavate; ovary 2-carpellate, ovules often 7 per locule, pendulous,

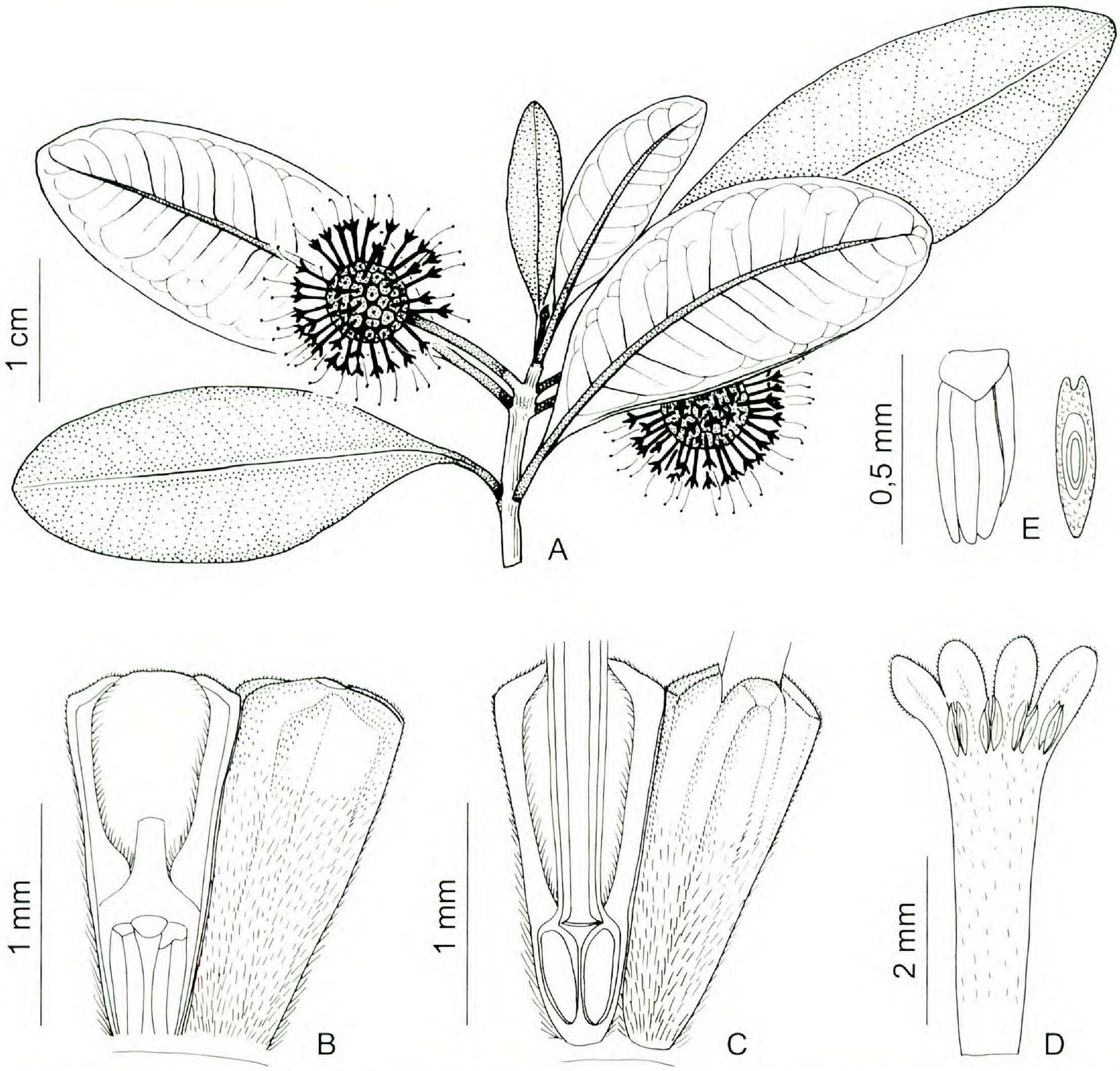

Figure 1. *Gyrostipula obtusa* Emanuelsson & Razafimandimbison. —A. Branch with two inflorescences. —B. Two adjacent flowers: median dissection through flower and ovary, showing a calyx and only one of two carpels (left) and entire calyx (right). —C. Two adjacent flowers: median dissection through flower, showing calyx and corolla tube and the 2-carpellate ovary (left) and entire calyx and part of the corolla tube (right). —D. Opened corolla with stamens. —E. Placentae with four visible ovules attached side by side (left) and single ovule (right). Drawn from the holotype, *Service Forestier 27633* (TEF).

attached side by side from bases of triangular placentae. Fruits unknown.

Distribution and habitat. Only known in Madagascar from north Seranampotaka, between Nosiarina and Antsirabe-Nord (Sambava District, Antsiranana Province); midelevation degraded subhumid forest.

The following key includes the three known species of *Gyrostipula* in Madagascar and the Comoro Islands.

KEY TO *GYROSTIPULA* IN MADAGASCAR AND THE COMORO ISLANDS

1a. Leaves 10–18(25) cm long, inflorescence axes 3–6 cm long; Comoro Islands . . . . . *G. comorensis*

1b. Leaves 2–10.5 cm long, inflorescence axes to 1.5 cm long; Madagascar.

2a. Leaf apex acute to acuminate, petiole 10–25 mm long, inflorescence heads 2.1–2.5 cm diam. (styles included) . . . . . *G. foveolata*

2b. Leaf apex obtuse, petiole 4–8 mm long, inflorescence heads 1.2–1.7 cm diam. (styles included). . . . . *G. obtusa*

Discussion. *Gyrostipula obtusa* is readily distinguished from *G. foveolata* by the characters mentioned in the key. The venation also reveals features that are diagnostic. In *G. foveolata* lateral (secondary) veins are ca. 5–10 mm apart and their angles of attachment to primary veins are mostly narrower than 50°. In *G. obtusa* lateral (secondary) veins are ca. 2–4(5) mm

apart and their angles of attachment to primary veins are mostly wider than 60°.

IUCN Red List category. *Gyrostipula obtusa* is known only from the type specimen, suggesting that it is a rare species. However, it is possible that the species still persists within some of the nearest protected areas (e.g., the Marojejy and Anjanaharibe-Sud National Parks), which have similar forest and habitat. The species should be classified as DD (Data Deficient) according to IUCN criteria (IUCN, 2001).

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